Industrial Finishing

Reg. U. S. Pat. Off.

An Independent Publication Devoted to the Finishing of Industrial Products

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Letters

The names and addresses of those whose letters and inquiries appear in this department may be had by writing this office, or letters addressed to them in care of this office will be forwarded promptly.—The Editor

Whose Bedroom Suite?

One of our customers has just written us requesting we send them samples that will produce a finish as recently shown on an oak bedroom suite exhibited at the Grand Rapids show. He states this suite is finished in light green and the pores are filled with some silver gray color.

On account of our not being familiar with this finish we are unable to comply with our customer's request. Can you inform us in any way who manufactured this particular bedroom suite so that we may endeavor to get the correct shade, or find out just how this particular shade is arrived at.—T. Paint & Varnish Co.

Looks Inside Barrels

We had drawn to our attention a brief article on a drum examining periscope, printed in your February issue. We would be interested in learning the name of the manufacturer of this equipment.—U. J. Varnish & Color Co.

The periscope for examining the interiors of paint and varnish drums is a product of Kollmorgen Optical Corp., 767 Wythe Ave., Brooklyn, New York.—Editor

Metal Sprayers

In the May 1932 issue of the INDUSTRIAL FINISHING we notice an article by Mr. J. H. Edwards, regarding metal spraying, which is of particular interest to us.

As manufacturers of spray guns, we meet with many inquiries from clients about this process and would appreciate it if you could let us have further particulars, both regarding the type of gun employed and the method of application, particularly the heating process involved.

(Continued on page 6)

From the Editor's Desk

Tool Up For Quality

ONE OF OUR New York correspondents reports a "National Quality Movement" to speed business recovery, foster consumer confidence in merchandise values, and combat hoarding of buying power. Leading manufacturers and retailers numbering 130 persons launched this movement in New York City recently.

The president of the new organization, P. A. O'Connell of Boston, stated that "a return to quality is the most effective step any group can take to speed the recovery of business and bring back national economic prosperity." He also urged that in the search for quality, attention should first be accorded American-made products.

The chief object of this latest drive to establish a merchandising policy all over the country is to give full measure in quality, to show the distinction between a price bargain and a quality bargain.

Sick of "Stylized Junk"

THE ARTIST, Nysa McMein, speaking from the standpoint of the consumer, said the time had come to call a halt on the production and distribution of "stylized junk." She said also that if retailers "give shoppers their money's worth, women will crowd their stores like locusts." Playing an important rôle in this National Quality Movement will be manufacturers, resident buyers, broadcasting stations, the Advertising Federation of America, trade journals and newspapers.

Better Furniture

MR. ED. HUFFMAN, who has been traveling in Ohio tells us he is keeping in touch with dealers in his territory and he finds that "these dealers are very low on merchandise and they are stocking up right along with the present day demands—not cheap furniture but something with good design, construction and finish, mostly in walnut and birch (finished maple) so that they will have something more to talk about than just price, price, price.

"When a dealer says: 'I can get the same piece for less money,' I ask him for the cut and photograph, and explain the machining and construction, the woods used, also the finish of my article over the one that he had in mind. The dealer in turn, tells the customer about quality instead of price, and makes a sale nine times out of ten, because even today . . . the consumer wants quality instead of quantity in her home, when it is a question of furniture."

W. H. Rohr

Twist the metal until it breaks

Alaka Flexible

Black Enamel No. 957

will *not* come off

A skeptic asked us: "Is it flexible?" We handed him a brass strip covered with Alaka Flexible Black Enamel No. 957. He twisted and bent and finally broke the brass. The enamel didn't come off. He scraped, scratched, pried with his nail. The enamel refused to part from the metal. *Try this test yourself:* Phone us for the flexible brass and the flexible black enamel (glossy, eggshell or dull). See for yourself how *flexible* they are. Prepare your own sample; twist it to your heart's content. Why, No. 957 enamel is *more flexible* than flexible brass! And hard! For makers of name plates, vanity cases, hairpins, novelties, stampings, nothing is quite as good.

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220 25th St. Brooklyn, N. Y.

(Continued from page 4)

It may be that you could also pass our inquiry along to the particular manufacturer concerned who, no doubt, would be pleased to forward us descriptive literature.

As a subscriber to your journal we take this opportunity of complimenting you on the high standard of its publication. The many interesting articles contained therein are most helpful to us, and we daily recommend your journal to spray operators and finishing workshops.—John B. Arnold Pty. Ltd., Melbourne, C. 1. AUSTRALIA.

Coated Fabrics

We are enclosing a Plymouth gasket and would appreciate your advising us where we can purchase similar material. We would also appreciate your informing us, provided you can do so, where we might purchase a machine for graphite asbestos in rolls, 10-in. wide, .045-in. thick.—U. G. Mfg. Co., (Electrical Appliances)

Rubbing Machines

Could you put us in touch with any firms selling used rubbing machines?—D. D. Co. (Caskets)

Stripers; Automobile Enamel

I understand there is an auto striping device on the market, known as "Scoles Striper." Is this device a success? If so, I would like to have the name and address of the manufacturer or distributor; also the name and address of any other striping device on the market.

Please include, too, the name and address of a manufacturer or distributor of special high grade automobile enamel or lacquer. The standard paints I have used do not hold up, do not stand the weather, and soon lose their luster. Is there any paint or enamel that you can especially recommend, something that dries hard, retains luster and will withstand frequent polishing?

Any information you can give me will be very much appreciated.—G. X.

Wood Putty Under Lacquer

Will you kindly advise us what kind of putty can be used under lacquer, on walnut, that will not turn white after the lacquer is applied?

(Continued on page 42)

"I know what lacquer can do! But it's got to be LACQUER to do it . . ./"

"No, your whole industry hasn't produced anything yet that can take the place of lacquer. But you can't make real lacquer by substituting a lot of other things for the good solvents like Butanol and Butyl Acetate. And besides, we've learned that it costs less to make lacquer with Butanol."

Lacquer users bent upon the utmost in finishing efficiency and economy, specify "formulated with Butanol and Butyl Acetate."

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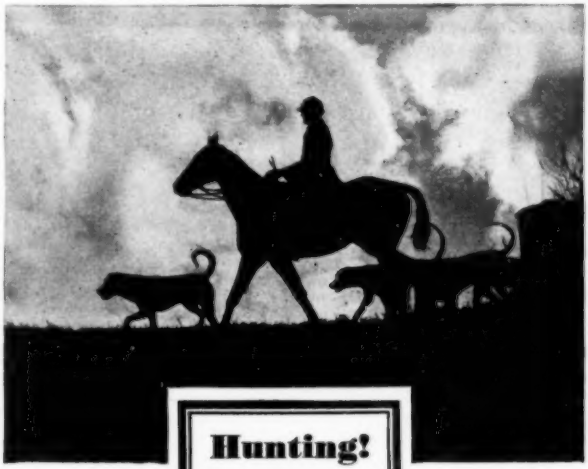

Hunting!

During today's hunt for needlessly high costs, industry at the same time realizes that the appearance of a product plays an important part in its sale; and that a smooth, even, attractive finish may be the vital factor in its purchase. That is why the finish of a product is so important; it must be a good finish but not a costly finish.

If you are facing this problem of better appearance at lower costs, follow the example of many other industrial finishers who faced the same problem and got the answer from the DeVilbiss representative. Not only is he thoroughly trained in all phases of industrial finishing, but he has back of him all the resources of the entire DeVilbiss organization and the vast fund of practical knowledge of DeVilbiss engineers. What may seem to you to be a difficult situation in your plant, may be easily and quickly met when you talk to the DeVilbiss man. He will study your entire finishing process and his recommendation will be that of a skilled specialist. It will be honest, practical and reasonable. Send for him. Or write.

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The New *Industrial Finish Salesman*

by C. Dan Youngs

During the past two years there has been a new industrial salesman on every territory in the United States.

INDUSTRIAL finish salesmen who have survived the business revolution which has taken place in the industrial finishing field have become changed men. Others have been forced to join that great army of the unemployed, not by voluntary enlistment but by the draft of stern circumstances.

This New Era of business—with its decreased buying power, its keener research into materials, its more intelligent pursuit of operation economy, its consequent scrapping of methods of operation and procedure which have existed almost from time immemorial—has resulted in a violent upheaval which has thrown from its maw those salesmen who hadn't the ability to ride the wave, to study the trends and apply such study in governing their daily work. They have been cast aside, nor will a place ever again be found for them—in selling industrial finishes. In their stead are the new salesmen—those who offer more than the mere opportunity for purchase.

To the others, those who have survived and have been more or less adaptable to changing conditions, this metamorphosis has been beneficial and valuable, despite lowered sales volume and lessened income. It has changed the successful industrial salesman from a type who believed prospects should buy from him simply because his firm sent forth the dicta that their materials were the best, that every buyer needed but to have this repeated to him, and orders would flow in as a natural sequence.

In place of this fallacious theory has arisen the knowledge that a salesman only knows his materials are salable insofar as he is capable of showing, not telling, his prospective buyer of their good qualities. But even this is not sufficient in this new day; in addition to this the successful salesman must be able to show and prove that his materials will be most suitable in price as well as in quality, that in all ways they will best fit the work for which they are offered.

New Standards of Quality

The pendulum is now swinging backward. In place of the old buyer who reasoned that no finish was good unless it was costly, who was afraid of any marked difference in price, who boasted the best was none too good for

his product, is the one who now has been forced by economic conditions to safeguard each dollar expended for materials, and who is buying materials to match the quality of the product he makes.

He realizes he cannot compete in a market calling for low-priced materials if he pays $4.00 for a finish he can secure for $2.00. He is obliged to use a sliding scale in his purchases and has found out that it is impossible to give a high class hand-rubbed job where flat lacquer alone will answer. Otherwise his competitors would undersell him.

This, the new salesman has been obliged to consider, for it has meant a decrease in his sales volume, and he finds out that if he does not sell this cheaper finish, someone else will. He has had to work harder to balance lessened sales volume by securing more orders, and this has been far from easy. It has meant longer working hours, more calls per day, and more efficiency per call. He has had to delete from his talk the obvious, the irrelevant, and concentrate on those things which are pertinent to the object in view—that of securing an order.

The temptation to discuss these changed conditions is great, especially where friendship exists between buyer and seller, but the new salesman has found this to be a mistake. No buyer cares for a continuous crooning of the blues; he can get enough of that around his own plant; nor, on the other hand, does he care to hear any half-baked Pollyanna-like observations about upturn being just around the corner and headed his way.

Assist the Buyer

The new salesman has discovered what will most please the buyer is some constructive well thought out suggestions whereby he can effect economy in his buying or plant operation, and has learned that general suggestions are not considered unless they deal specifically with some phase of his operating problem.

The new salesman who has realized this is cashing in, even in hard times. He might well be termed a "Finishing Room Physician," for he is able to diagnose, prescribe and even cure ailments in the finishing rooms he visits. His fee will be more than ample in the shape of business secured in return.

He has built for the future. When times are again normal (and it is idiotic to believe they will not be) then he will be remembered as the man who gave help when it was needed, and it will be hard indeed for his competitors to break in on a business relation fostered in this manner.

This new industrial finishing salesman is one who knows his own proposition thoroughly; he has personally tried out and tested the materials he offers for sale; he has confidence in himself, in his house and in the future of business. He is also willing to study the details of industrial finishing in all their aspects, whether or not they pertain to his own particular field in the craft of finishing, and is able to offer suggestions which will be beneficial.

Above all, he has learned to keep his personal troubles in the background, giving prominence to but one thing—the desire to serve. With this type of salesman, orders will follow as naturally as day does night.

"Ventilaire" is the name of a new type ventilating fan (14 remarkable features) by Vallen Electrical Co. Inc., Akron, Ohio.

Etching and Finishing Stainless Steel

by M. H. CORBIN
of The Ault & Wiborg Varnish Works, Inc.

"Because of its strength and non-tarnishing properties, stainless steel is finding its way into the decorative arts, particularly in the architectural fields. For this purpose, various designs are required to be etched in the metal, after which the surface may be finished, if desired, in colors for decoration."

●

A NUMBER of different alloys on the market are classed under the heading of stainless steel and iron. These alloys are essentially combinations of chromium and nickel with iron. Slight variations in the ratio of these constituents, as well as the introduction of other elements, affect both the physical and chemical characteristics of the alloy, the exact ratios being dependent upon the use to which it is to be applied.

The usual procedure of etching other metals is applied to stainless steel. The metal is polished with a pumice-oil mixture in the regular manner. However, if it is to receive a buffed finish, better cutting is obtained by using a slightly harder abrasive. The plate is then washed in gasoline so as to remove any residual oil or wax from the surface.

The acid resist is now applied. This is accomplished in two ways. One method is by photographic means, using either a sensitized varnish film or sensitized albumen. This method, however, is not so widely used. Therefore, we shall confine our discussion to the usual practice of printing an ink base to which asphaltum powder is made to adhere, the excess powder being freed from the unprinted portion by means of water or talcum powder.

It is advisable to warm the plate to about 100° to 120°F. before printing. By printing a warm plate, the wax in the ink will soften and result in a more continuous film, and hence a better impression. The plate is then baked in the proper manner, keeping in mind that the purpose of the bake is to fuse the asphaltum powder with the solids in the ink so as to obtain a continuous film.

On stainless steel, difficulty is

generally experienced in getting the acid resist to adhere to the plate. The resist also shows a tendency to break away from the edges during the etching operation. These difficulties are remedied by regulating the wax content of the ink to meet the conditions. Offhand, the writer would suggest approximately two (2) parts of ink to one (1) part of wax. However, the exact proportion can be determined only by trial. Each type of alloy requires a slight change in the formula. Hence to unconditionally recommend a set formula would be impossible.

Care must be taken also to avoid over-baking. This would cause a decomposition of the wax, which would result in pinholes, brittleness, and making the resist unusually hard to remove.

The Etching Process

After the plate is printed, baked, and painted on the back, it is then etched to the desired depth in a neutral ferric chloride solution, 35° to 40° *Baume*. An excess of hydrochloric acid speeds up the action, but at the same time results in a coarser ground. The neutrality of the solution is determined by the effect produced by the solution on a piece of brass. An acid condition gives a crystalline surface, while an alkaline condition causes a brown deposit of ferric hydroxide on the surface.

A neutral solution gives a uniform scum appearance with a very bright line at the edge of the resist. The solution in this condition gives a smooth surface to etched portions. From the etching solution the plate should be immersed either in a 25% hydrochloric acid solution or a solution containing aliquot* parts by weight of sulphuric acid and sodium bichromate, using about eight (8) ounces sulphuric acid per gallon of water. This solution will remove any film or scum on the plate, giving it a bright crystalline appearance. If the etched portion is not to be colored, the resist should be removed at this point and the entire plate immersed in a 20% solution of nitric acid. This will "passify" the surface, making it more resistant to tarnish and corrosion. It should be left in this solution for 15 or 20 minutes.

If Color Finish Is Desired

On the other hand, if the etched ground is to be colored either chemically or with enamels, the resist should be left intact. In the case of black nickeling, this is usually accomplished by means of a black nickeling solution. Since most of the readers are familiar with this operation, it is not necessary to go into detail on this process. Difficulty, however, is sometimes experienced in not being able to get an adherent and flexible deposit. This can be overcome by first zinc-plating the portion to be blackened and then immersing the object in the black nickel bath without current. Make sure the anodes are withdrawn from the bath; otherwise a potential will be set up which would cause a reversal of the deposit.

If it is desired that the background be finished with pyroxylin enamel, the enamel is sprayed over the entire plate. After it is thoroughly dried, the plate is im-

* Designating a part of a number or quantity which will divide the number or quantity without a remainder; a sub-multiple; thus 5 is an aliquot part of 15. Opposed to aliquant.

mersed in a special solvent for about 15 minutes. This solvent works its way through the enamel and softens the asphalt resist. Hence, where the enamel was applied over the resist, which would be on all the "high lights," it can be easily wiped off.

To Prevent Enamel Peeling

Trouble is sometimes experienced that the enamel peels from the background during this operation. This can be caused by not having the etched ground chemically clean, viz., free from scum or film. The cleaning solutions given above should eliminate these difficulties. However, it might be well to also give the background a "passify" treatment, as mentioned above, with nitric acid before applying the enamel.

Another cause of this peeling might be due to the pyroxylin enamel itself in that it does not adhere sufficiently to the metallic surface, viz., its cohesion is greater than its adhesion. Then again, perhaps, the plasticizer is removed by the solvent, hence causing a destruction of the original physical properties of the film. Therefore, to remedy peeling, two essential points must be carefully noted: (1) make sure the plate is chemically clean, (2) make sure the proper enamel is used.

The plate is then washed in clean gasoline and dried. Although it is not essential to lacquer the plate with clear lacquer it is quite advisable to do so, as it gives added protection and gloss to the enameled background.

Cloth can be sprayed with metal, resulting in the most practical metal cloth available.

FINISH WIT-HUMOR
ONE-WHY DID YOUR GIRL WALK HOME LAST NIGHT?
TWO-SHE'S A ROAD COMMISSIONER, JUST TAKING A ROAD TEST.
TOUCHING UP—
AND NOW THE BOYS WILL DO THEIR MIXED QUARTET SONG—
WHEN I FINISH SCHOOL I'LL GO TO COLLEGE— BUT WHAT WILL I DO WITH ALL THIS KNOWLEDGE
WHERE IS YOUR WIFE?
O, SHE WENT TO BUY A DRESS TO MATCH THE "HANKY" SHE WON AT A BRIDGE PARTY.
DID YOU EVER GET PINCHED FOR SPEEDING-?
NO! BUT I SPEED IN A PINCH.

Nitrocellulose, Synthetic and Novelty

Lacquer Display Finishes

by J. H. L. HARRIS

The Egyptian Lacquer Mfg. Co.

DISPLAYMEN constantly come in contact with finishing materials of various types, one of which is lacquer. More and more do we rely on color and beauty of finish to increase the salability of our product, or as a background for its display. In contrast we need only look back ten years ago to when practically all automobiles were finished in a dead black color. Contrast these with the present vari-hued cars and you realize the extent to which color has become a factor in our modern lives.

Color has, also, a very definite relationship to the condition of mind of a buyer. Certain colors should be studiously avoided; other colors should be used frequently. Unconsciously, we follow these rules in the use of warm colors rather than cold colors.

Lacquer is decidedly different from paint or varnish. Generally speaking, lacquers embrace all those products which use nitrocellulose, or nitrated cotton as a base. Paints and varnishes are types of material which use linseed or vegetable oils as a base. Lacquers have a decided advantage over the old type of finishes in that they offer a greater color range, and are, in general, more durable and waterproof.

Excerpts from talk made before the Pacific Coast Displaymen's Convention.

What's in Lacquer

In nitrocellulose lacquer, pyroxylin is used to provide the necessary durability. Plasticisers give elasticity to the film, the gums and resins add the required adhesion; pigments and dyes impart the desired colors to these solids which eventually constitute the lacquer film. Before these solids can be applied they must be made fluid, and to accomplish this, without in the least disturbing the lacquer formula, solvents are carefully and scientifically blended so they will work evenly on all of the substances that go to make up the lacquer.

Lacquer, as sold in commercial use, is usually furnished heavy so that it requires the addition of considerable thinner or solvent to make it readily handled by a spray gun. The purchase of this thinner is just as important as in the

case of the lacquer, and it is quite possible to ruin a quality lacquer by using a cheap thinner in it. One of the difficulties obtained through the use of a cheap thinner, is blushing. This is merely the precipitation of small particles of cotton due to imprisoned moisture. In general, a cheap thinner will dry faster and set up quicker than a slow-drying thinner. Quality, reputation and integrity of the maker is your best and surest guide in the buying of such material as lacquer.

Labor, Two-Thirds of Cost

In most finishing jobs, labor represents as much or more than two-thirds of the total cost, while the finishing material is only one-third, therefore it is very important that the finisher know what he is about.

There are several methods of applying lacquer. It may be applied with a brush, it may be dipped, or it may be sprayed. The latter is the most popular and the most frequently used method. An air pressure of 30 to 60-lbs. is used generally, dependant on the class of work one is doing. It is highly important that the compressed air be free from moisture or oil, and that the spray gun be kept clean, as well as the various containers used.

Silk Screen Process

The silk screen process is another method used, and adaptable to displaymen's work. The apparatus consists of a frame over which is stretched silk bolting cloth. The design is outlined on this cloth, and by various methods, including the gluing on of paper, or marking out with shellac, certain portions of the design are blocked out. Silk screen paste is then applied, and rubbed across the surface with a squeegee tool. This process is repeated on separate screens for different colors, and is very effective where many copies of one sign are to be made.

Lacquer is available in various forms, in a large range of colored opaque materials called lacquer enamels, and in transparent coloring for glass and other articles. It is obtainable as a bronzing medium to which bronze powder is added for obtaining gold and silver effects. It may be used as a clear, protective coating on metal, and new, specially developed grades are adaptable for outside use exposed to the weather.

Synthetic; Jack Frost

One of the latest developments in lacquer is a new synthetic finish. In place of natural gums, synthetic or artificial gums are used, and many outstanding advantages are obtained through the use of these materials over old style oil enamels. They are generally more durable, dry fast, have excellent coverage, are resistant to weather, and are, in many cases, lower in price than lacquer.

"Jack Frost" is one of the latest developments in the line of novelties. Already displaymen have taken advantage of the possibilities of such a material for the outstanding and remarkable effects obtainable. This material is applied with a spray gun preferably, although it may be brushed, heavy coats making large crystals, and light coats, fine feathery effects. The colors may be blended together, both being sprayed while wet. The finish goes on in a plain smooth surface, the crystallizing effect starts immediately, and takes place usually in 15 to 30 minutes.

It is quite important that this finish be kept away from drafts,

and absolutely uniform effects should not be expected. The finish is available, also, in opaque form, which may be used to cover up rough or colored surfaces. It should be applied over a clean surface. It may be used preferably on glass or metal, also on foil paper or on any other surface after a proper sealer coat has been applied. Glue may be used as a sealer, although special sealers for this purpose are on the market.

Crackle Lacquer

Crackle lacquer is a finish which has perhaps been overworked in certain lines of industry, due to the jazzy effect created by the use of brilliant contrasting colors. A new development in this field is transparent crackle lacquer, which may be applied over any other color, giving an imitation leather effect which is very attractive. The surface should be built up as with any other finish, to cover defects on the surface. The application consists of a ground coat of lacquer enamel or bronze powder, a coat of crackle lacquer, and a top coat of clear lacquer. An endless variety of combinations may be had by the use of various colors with this material. As is true with the Jack Frost, a heavy application produces large cracks, and a light application produces fine cracks.

Pearling Lacquer

Pearling lacquer is another late development in the industrial field, and one which produces some very beautiful effects, already in use by many displaymen. You have all seen some of the late automobiles finished in pearling lacquer, and the effect, particularly in the sun, is amazing.

Contrary to the general impression, pearling lacquer is not made from ground fish scales. From underneath the scales of certain small fish, a small deposit of guinan crystals is obtained. You, who are fishermen, undoubtedly have noted floating on the top of water while cleaning fish, a small amount of this same crystal. Guinan crystals are carefully graded, treated with several complicated processes, and made into the form of a paste to which the proper grade of lacquer is added, making what is commercially known as "pearling lacquer." The paste itself is known as "pearl essence," and is quite costly.

In the case of this material, as with others where a perfect reflecting surface is necessary, the underlying surface is prepared by the application of undercoats and fillers; then a ground coat of lacquer enamel is applied. Pearling lacquer is then applied on top of this, light or heavy, depending on the required effect.

Webbing lacquer, and "Tangelac," two novelty finishes recently brought out, are available to the display trade.

Bronzing Book Free

The Egyptian Lacquer Mfg. Co., Inc., 90 West St., New York City, has published and is sending to interested users a new book about "Bronze Powder and Enamel Finishes." Mention the type of product you manufacture when requesting a copy.

For Berry Bros. in Quebec

An announcement from Berry Bros. Inc., 211 Leib St., Detroit, Mich., says:

"We have appointed a new manager for our Quebec, maritime branch which is located at 1091 Wellington St., Montreal, Canada.

"Mr. Barwick Tudor, an experienced man in both industrial and trade sales is the new manager. Mr. Tudor is not new to Berry Brothers, having been with us several years ago in the same territory. Later on, selling the industrial trade in Ontario. Mr. Tudor assumed his new duties on September 1st."

BRIGHT
AS AN EBONY MIRROR

HIGH GLOSS
JET BLACK ENAMEL
XE 113

HIGH GLOSS
JET BLACK ENAMEL
XE 142

JET black, with a rich lustre to equal polished metal, these enamels are two of Zapon's most distinguished gifts to the art metal craft.

Black pigments—not dyes—are used, which guarantee a permanent and durable beauty, with a depth of finish that requires no additional buffing or polishing.

Black Enamel XE 113 is superb for vanities, compacts, and metal novelties. It applies smoothly and dries with a glass-like surface.

Black Enamel XE 142, employing the same black pigments with weather-resisting lacquer, is specifically designed for auto finishing, but has a host of other important applications where enduring lustre is desired on metal surfaces.

Zapon Laboratories will help you solve any lacquer or enamel dilemma. State your problem to us, and a staff chemist will guide you correctly.

"The Standard of Quality Since 1884"

THE ZAPON COMPANY

A Subsidiary of Atlas Powder Company

Stamford ZAPON Connecticut

How to make

A Hundred Stain Samples

from only two formulas

"I have never seen anything like this published in all of my 34 years' experience. I believe this article will be of interest to manufacturers of stains and stain materials as well as finishers."

by E. W. BRUCE

IN MANY wood finishing shops the foreman has a very limited variety of stain colors with which to match what is ordered. It sounds like a big job to make 100 different stain samples, but it isn't. It is easily done with a minimum amount of work, as I will endeavor to explain.

The main thing is to be careful and accurate. Everything must be weighed and measured correctly; the quantity of stain color ingredients and the vehicle must be exact in every case. The least deviation in either will throw the stain off color.

I will explain how 100 different samples in stain shades can be made from two stain formulas. Let us assume that the finishing foreman has the requisite colors to make up the two following formulas, or similar ones.

Suppose the stain samples are to be for mahogany. Get ten pieces of mahogany 3-in. wide, 35-in. long and any desired thickness. After these ten pieces are prepared for the stain—that is, sponged with water and sanded—lay all of them in a row on an old panel or table top that has been covered with paper so that each piece can be numbered at the top, as in the accompanying illustration. Divide each strip into ten 3-in. sections by marking cross lines 3-in apart—each cross line being a ½-in. shellac stripe. These shellac stripes separate the sections and prevent the different shades of stain from overlapping. Give each of the ten horizontal sections a letter as per illustration, starting at the top with *A*. Begin at the upper left hand corner and number each section consecutively from top to bottom. It is advisable to stamp the numbers on the sections with steel dies, making impressions that can be read after staining. Now make a water stain from any desired formula. As an example, I submit the following:

Formula No. 1

Brown Mahogany	2½-oz.
Blue Black	⅝-oz.
Bichromate of Potash	5/16-oz.
Hot Water	5-qt.

Dissolve thoroughly and let cool. Divide into ten equal parts which should be ten 16-oz. pints. From one of these pints, stain one horizontal line of sections—starting at

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In football, touchdowns prove scoring ability. With your product, the finish may determine selling performance.

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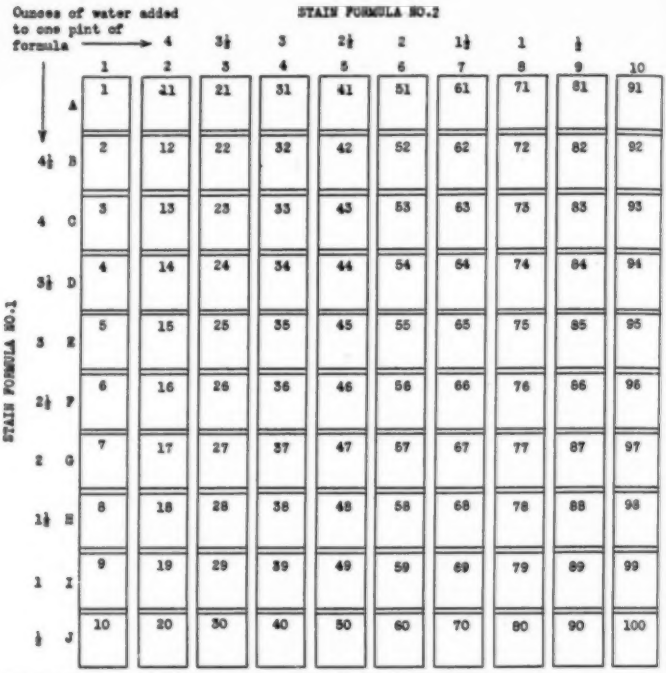

The 10 strips each divided into 10 sections make 100 samples, each of which is stained a distinctive shade as explained in detail in this article.

the lower left corner, line *J* and staining sections 10 to 100. Now add ½-oz. of water to another one of the pints of stain, and stain the ten sections in line with letter *I*, sections 9 to 99. Continue in this manner with each succeeding lettered line of sections on to the top, increasing the amount of water by ½-oz. every time. It is advisable to tag or label the stain containers to indicate the amount of water added to each of the pints. Let the stained surfaces dry and make another stain like or similar to the following:

Formula No. 2

Brown Mahogany	3⅜-oz.
Jet Black	27/32-oz.
Yellow	27/64-oz.
Hot Water	9-pt.

Dissolve thoroughly and let cool. Divide into nine equal parts, which should be nine 16-oz. pints. From one of these pints, stain one of these strips full length—strip No. 10, sections 91 to 100—from upper right to lower right in the illustration. Add ½-oz. of water to another pint of stain and apply to strip No. 9, sections 81 to 90. Continue in this manner from right to left, adding more water

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to each pint. Do not stain strip No. 1, sections 1 to 10 with stain made from Formula No. 2. Tag or label each of the nine pints with the amount of water added to each pint of stain. It is essential to use only clean, dry brushes for each of the 19 different solutions.

After applying stain to these 100 sections, allow the stained surfaces plenty of time to dry; then give all the samples a wash coat of shellac made in the proportion of one part of white shellac (which has been cut 3½-lbs. to the gallon) to five parts methylated spirits or alcohol. Let the surface dry and then sand it lightly and fill. As many different colored fillers can be used as are desired on the 100 samples, but it usually requires eight different fillers. Keep a record of the fillers used on the different samples. Be sure to give these samples the same drying time, attention and care that the regular line of work receives—no more and no less.

After the sample blocks have received a finishing operation so that a desired color can be picked out, suppose we find that sample block No. 6, strip No. 1, line *F*, (referring to the illustration) is the right shade. Our record shows this was made from Formula No. 1 by the addition to 2-oz. of water to the original pint which gives Formula No. 1 five quarts plus one pint (11 pints) of water, instead of five quarts of water.

Suppose block No. 34, strip No. 4, line *D* (see illustration) is the desired shade. Block No. 34 was first stained with Formula No. 1 stain with the addition of 3-oz. of water to the pint, which gives Formula No. 1 five quarts plus 1⅞ pints of water instead of an even five quarts of water. It was also stained with Formula No. 2 stain with the addition of 3-oz. of water to the pint which changes Formula No. 2 to 10 pints and 11-oz. of water instead of 9 pints of water. As will be seen the correct formula for any of the 100 color blocks can very easily be determined. All blocks are a two-stain proposition except those on strip No. 1, sections 1 to 10, but it is an easy matter to make any of the formulas a one-stain job.

Suppose that section No. 34, strip No. 4, line *D* is the desired color, and you wish to make a one-coat job. Look at the chart and you will see that 3-oz. of water has been added to the pint or 24-oz. to the gallon to the original Formula No. 1. There has been the same amount of water added to the gallon in Formula No. 2. Add both formulas together with the added percentage of water and stain a little block—say a 5x3-in. piece; let dry and you will probably see that it is a trifle lighter.

The stain mixer or the finishing foreman knows what dry colors have produced the desired shade in the two-stain job. After both formulas have been made into one and tried, he can tell just about how much less water to use per gallon to get the right color; he will not have to stain more than three or four blocks to do so. For a one-coat stain job the stain must be a little stronger than for a two-coat job. I always work from dark to light—that is, I make the stain a trifle darker by reducing the amount of water, and then I add water as I work to a lighter shade. Usually the third block from the darkest one is the right shade.

This method can be used with the new non-grain raising stains by obtaining the same solvents used in making the stain.

by C. C. WEAVER
Foreman Finisher for
Jenkins Music Co.
Kansas City, Mo.

Refinishing Pianos

WE REFINISH, on an average, 500 pianos annually. We use about 50 gallons of lacquer, and a little less of thinner each month. The two are combined in 5-gallon batches, in proportions varying according to the density of the lacquer; the amount runs between 30 and 50%.

We have been using lacquer since 1925. I think this company was one of the first to adopt lacquer for this work. I know we began using it while the Steinway company still did not consider it practical. We did have our troubles with it, too, because then it was so new that neither we nor the manufacturers knew what it would or would not do.

For instance, the directions said it could be applied over varnish. We lacquered a lot of pianos with it and they looked fine—for about six months. In the meantime we had kept right on lacquering over varnish and I don't know how many we had delivered before they began to make trouble. They made plenty of trouble.

That lacquer cracked and checked, and if there is anything wrong that it didn't do, I don't know what it was. We had to clean the finish off those pianos down to the bare wood and do them over. Many of them had been only slightly checked when we lacquered them.

Well, that taught us we could not lacquer over varnish, but we had excellent results on new or properly prepared surfaces and we soon developed the methods we are now using.

One great difference we found

between lacquer and varnish is that each coat of varnish is "piled" on top of the preceding coat, whereas each coat of lacquer partially dissolved those coats that had been put on before and became a part of them. Although each succeeding coat does add to the body of the finish, it does so in an entirely different way from what varnish does.

The pianos we refinish are almost always one of three hardwoods—oak, walnut or mahogany.

The first thing to be done to an old piano is to remove every bit of the old finish with varnish remover. The surface is then carefully sanded to a perfect smoothness with sandpaper varying from coarse to fine grade. Next a water stain (made by using a suitable stain powder) is applied. The piano is then allowed to dry thoroughly.

The pores of the wood are now practically as open as those in new wood, so they are filled with a wood paste filler. This filler is applied with a brush and allowed to dry for a period determined by the condition of the wood, the humidity of the air and the season of the year.

Surplus paste is rubbed off with burlap or excelsior, working crosswise of the grain.

The important thing, after wiping the filler, is to be sure the surface stands long enough to become thoroughly dry before putting on any finishing material.

Then clear lacquer sealer is applied with a spray gun. This sealer coat allowed to dry, and a coat of lacquer is applied every other day until the "body" is fully built up; this takes from seven to nine coats.

After the final coat is dry, the surface is rubbed with coarse pumice and water applied with a soft cloth or pad. Sometimes in the rubbing with pumice and water, high spots or sharp edges may rub through the lacquer. These places are "frenched out" with a small pad or cloth saturated with stain and lacquer, which blends into the surrounding finish invisibly.

After the pumice rub with water and felt pad the surface is again gone over with dry finer pumice and a large brush (a smoothing brush) such as is used by paper hangers; this eliminates all scratches and brings out a very fine satin finish. This lacquer finish is hard, waterproof and as nearly marproof as possible.

Pro-Tek, is a white cream which, when rubbed into the skin before working, forms a protective film soluble only in water.

Schaefer Co.; Louisville

The Schaefer Co., Louisville, Ky., (manufacturer of varnish, lacquer, enamels, stains) which has been in process of reorganization has announced its new official family.

T. F. McGuire, formerly with the Louisville Varnish Co., is president. Harry F. Schaefer, founder of the business, is vice-president and general manager; Tony C. Carter, southern salesman, is a vice-president as is James B. McGuire, an eastern salesman for the concern. Ralph Schaefer, son of Harry Schaefer, is secretary; J. W. Watkins, formerly with the Louisville Trust Co., is treasurer.

The new board of directors is composed of Tom McGuire, Harry Schaefer, J. W. Watkins, W. C. Schaefer (northern traveler of the company, and brother of Harry Schaefer) and T. H. Anderson, formerly with the Louisville Varnish Co.

This newly reorganized company has a modern plant and a sales organization composed of long experienced men covering large consuming districts.

Thomas H. Costello, a color expert and designer, formerly superintendent of finishing with Bassett Furniture Industries, Bassett, Va., has come with the company as a service man in advising customers on finishes, colors, etc.

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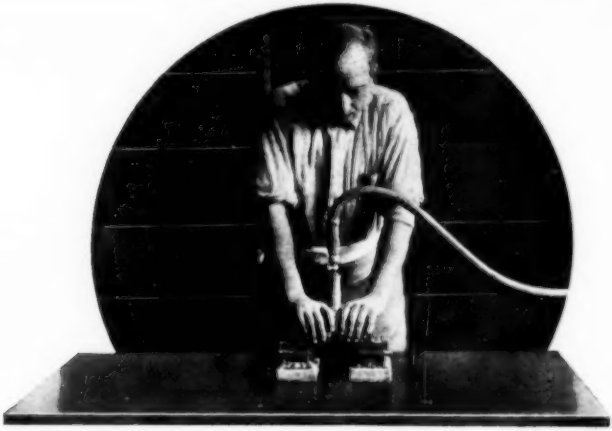

Fine Metal Furniture Finishing

by W. V. MORROW

SEVERAL contributions to progress have helped materially to make possible the present fine appearance of high quality steel furniture. Obviously, the well finished surfaces that grace modern steel office furniture depend first of all upon clean, uniformly smooth sheets of bare metal.

In general, all steel furniture products pass through several separate classes of operations, namely laying out, notching, bending, laying out for welding, assembling, welding, surface finishing, final cleaning and inspection. The two most interesting of these are welding and finishing. In this article I will deal particularly with the metal cleaning and finishing operations as they are performed in the plant of the Art Metal Construction Co., Jamestown, N. Y.

From a merchandising point of view, probably the finishing process is most important, as "eye appeal" is the factor that determines most sales. The American people are notably style conscious in their office furniture as well as in their clothes, automobiles, and the pets they adopt. From a merchandising and manufacturing point of view, the finish is so important that about 15% of the

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time devoted to making steel furniture is consumed in that operation.

Finishes must combine beauty with durability; they must not crack, peel, nor chip, and under ordinary usage should never need retouching. The high standard of steel sheets has helped the finisher realize these objectives.

Operations on Sheet Steel

When the formed steel sheet or assembly starts its journey through the finishing process, it goes through these operations in sequence: (1) Cleaning, (2) sanding, (3) primer coat, (4) baking, (5) testing, (6) sorting. Now at this point, those places which will be concealed when finally assembled are separated from those which will be exposed to view. The latter pieces then continue through a further processing as follows: (7) Filling, (8) baking, (9) sanding, (10) second coat, (11) baking, (12) sanding, (13) cleaning, (14) final coat, (15) baking, (16) rubbing, (17) graining, (18) varnishing, (19) baking, (20) rubbing.

Graining

Special finishes or enameling will increase the number of coats as well as the number of times the piece has to be sanded, baked, and rubbed.

Metal Cleaning

Cleaning is usually done with benzine to remove all grease and oil. It is then very important that the sanding be thoroughly done, for if rust, no matter how minute in quantity, remains on a sheet of steel, it will spread with age, and in time will raise the color and flake off. It will appear as though acid were eating its way out of the metal.

When the metal is ready for the primer coat, the operator handles it with cotton gloves to prevent contact with perspiring hands. The organic compounds coming from skin pores mark or rust the steel and lay the foundation for rust. The first or primer coat is applied either by dipping (if the piece is of proper size), air brushing, or hand brushing. In any event, the operator must make certain that every part inside and out, is thoroughly coated. The piece is then put into an oven and baked for five hours, usually at 250° F.

Provision is usually

made in metal plants for testing the finish after baking. Tests are made on small samples of steel which follow the regular finishing routine. After baking, these samples are bent at sharp angles and hammered; the finish must not flake nor show creases. If one of these pieces flakes, the operator thoroughly inspects the larger pieces and may repeat one or more of the preceding processes to discover the trouble and correct it.

Putty Filling; Sanding

The material which will be exposed to view requires further processing, and is then worked over by a skilled artisan with filling material and broad putty knife. He fills any crevices in the steel with a plastic mixture of pigment, clay and oil, and the piece is rebaked for five more hours at the same temperature as before. More bending and flaking tests are made on samples; the filler must not be brittle. Pieces are then thoroughly sanded and the next color coat applied either by air or hand brushing, depending upon the class of work. This coat is also baked.

Two-coat work is then sanded with fine sandpaper or emery cloth in order to produce a smooth, even surface. It is cleaned with chamois skin and compressed air to remove dust and specks, and is delivered to the finishing room for the final coat which is usually brushed on and baked at the same degree of heat as the previous coats.

Rubbing; Graining

Three-coat work, after removal from the ovens, is passed over to the rubbing department where it is rubbed with fine pumice stone and oil until perfectly smooth, after which it is sent to the assembling department.

If the piece is to be grained to simulate wood, the same operations of dipping, sanding, and filling are followed as for the plain colors, but in order to match the natural wood accurately, it is important that the ground coat and graining colors be mixed to the correct shade. To determine these shades, it is necessary to bake out and grain small samples to match the color exactly.

Graining is a hand operation and requires the services of skilled artisans. After the color has been applied, the metal is baked and then rubbed with a hair brush in order to remove all specks before the varnish is applied. Then two or three coats of varnish are put on, each one being baked and, after baking, rubbed.

Crinkle Finish for Warmth

The criticism is sometimes voiced that steel for desks, chairs, and other office equipment is objectionable because it has a "cold" and "clammy" feeling. Actually a wood desk and a steel desk in the same room (with no air currents) are exactly the same temperature. The sensation of coolness of the steel desk comes from the fact that steel is a better conductor of heat and also has a high thermal capacity, so that when any portion of the human body comes in contact with it, heat flows from the body to the desk.

There is a greater area of the fingers or portion of the hand in contact with a smooth enameled surface than when the porous non-uniform wood surface is touched, and the sensation of coolness is intensified by this condition. One of the leading manufacturers, the General Fireproofing Co., has developed a "crinkle finish" which does not have a cold feeling (although this was not originally developed for the purpose of over-

coming the sensation of coolness which seems to be overstressed by those who can find nothing else wrong with a steel desk!). This finish was developed, along with others, in order to give the steel desk an identity of its own and about which there could be no suggestion of imitation.

The crinkle finish is rough enough to form air pockets between the skin and the surface it touches, thus affording a comparatively small area of contact. In addition, the insulating effect of the enamel is greater because it is considerably thicker at the raised points. This finish feels the same as wood or any other "warm" material.

The crinkle finish effect is produced in the second coat. A priming coat is sprayed on and baked, giving the usual flat surface. The crinkle coat is then sprayed on; it also is smooth when applied, but it crinkles in the baking process. The finish coat may be any color desired, either plain or mottled.

At the present time, most of the demand is for reproductions of wood effects. However, there is a growing demand among architects and interior decorators for finishes which reflect the distinctive qualities of steel. They believe like Plato that "beauty is the splendor of truth," and that the finishes on metal should reflect the intrinsic merits of the material and not be imitative of another medium. This movement encourages the fabricator in bringing forth new finishes which will help promote steel for office and household equipment.

Butyl alcohol's use in the modern finishing room is wide and varied. It qualifies as a nonsolvent, a dehydrator, and it has no unpleasant odor nor effects.

Oil Burner Finishes; Colors

METAL finishes and color schemes as applied to oil burners are of vast importance to their operating efficiency and sale, according to sales executives and factory engineers who attended their exhibits at the Rochester Industrial Exposition, Sept. 5 to 10, although methods of accomplishment differ.

Aluminum paint and black enamel used by the Lennox Furnace Company, Inc., Marshalltown, Ia., presented a striking color contrast. "We use an aluminum flake mixed with a suitable 'bronzing' liquid" one of the heating engineers explained. "This aluminum paint is a rust preventative unaffected by heat; it is odorless and, as you see, it is decorative," he added, indicating the bold relief in which the black enamel lettering stood out upon the silvery colored front.

The "Red Flash" oil furnace, manufactured and displayed by American Radiator Co., was finished in a deep maroon enamel. The "copper oxide" red is heat-resisting and retains its color, the sales representative declared. Then too, he added, red is attractive and is associated with heat in the minds of prospective buyers.

Similar reasons were advanced for the black and red enamel color idea used on the Gar Wood oil furnace exhibited by the Wood Hydraulic Hoist and Body Co., of Detroit. "With the present conversion of basement into amusement rooms women are giving consideration to striking color schemes and neat furnace appearance," the local sales representative said.

Some oil burners exhibited were painted with asphaltum. While this preparation duplicates many

advantages of certain other finishes, several heating engineers argued against its application because of the possibility of "odor under heat," especially when the burner is new.—R. J. PHILLIPS.

Lacquer Enamel Finish for Castings

CASTINGS to be finished should be thoroughly cleaned free from grease, sand and other foreign matter. A sandblasted surface is a great help for perfect adhesion of the priming coat. I suggest six operations as follows:

1—Apply by brush or spray gun one thin coat of red oxide lacquer primer. Air dry one hour.

2—Spot all sand and blow holes and other surface imperfections with pyroxylin filler. Air dry two hours.

3—Cut down filler to an even surface with No. 2/0 garnet sandpaper, having paper thoroughly wet with water.

4—Apply by brush or spray gun one or more coats of lacquer surfacer, depending upon smoothness of castings and quality of finish desired. Air dry three hours.

5—Sand surfaces, using same grade of sandpaper with plenty of water, which allows paper to cut freely without gumming up, and gives a much smoother surface. Wash with water to remove all sediment left from sanding. Allow surface to dry thoroughly before applying finish coat.

6—Apply by brush or spray gun one or more coats of lacquer enamel of the desired color, depending on quality of finish wanted.—J. E. GREENE (Industrial Demonstrator).

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Questions and Answers

Tumbling Square Blocks

We are referring a finishing problem to you for information and advice. The problem is to finish with lacquer enamel small pine blocks, 1-in. wide, 1-in. thick and 2-in. long. A tumbling barrel is our idea of the most economical way to handle these, but having had no experience with these we are at a loss as to the proper lacquer to use and the proper procedure to follow.

If you have any information or literature on this matter we would appreciate what help you could give us.—B. M. N. & Co.

In reference to the finishing of small pine blocks 1x1x2-in., we believe you would not find tumbling satisfactory if these blocks have flat sides and square corners. Tumbling is more adapted to the finishing of small articles which have rounded surfaces. We believe dip-finishing would be the better way of coating the wood blocks you mention. You probably know you can dip a number of these small blocks in wire baskets. This basket dipping would probably do all right for a first coat, although we question whether it would do for the finishing coat. For a finishing coat the pieces should be dipped individually—or in multiple if space separates the individual blocks.—I. F.

Reed and Fiber Finishing

Referring to E. F. P. Co's. letter on pages 4 and 6 of August issue, I would like to ask, "Is the reed and fiber glue sized?" If so, care should be taken to avoid getting a heavy film of glue size on the surface, as this retards a perfect adhesion of the undercoat, causing the finish to chip off easily.

There are undercoats that dry in much less time than 24 hours for recoating, and they give good adhesion; also there are enamels that dry perfectly in less than 20 hours for assembling. These materials could be used for the refinish work. Extra care should be used in removing the cleaning solution.—J. Edwards.

Dipping and Whirling Golf Tees

I am prompted to write this after having read "Tumbling Golf Tees" in the "Question and Answer" department of August issue (pages 44 and 45).

There are two types of washing machines that can be used successfully for finishing small articles

made of either wood or metal. These machines are of the regular washing-machine type in outward shape, but have a vertical shaft in the center on which is fitted an inner chamber. The chamber is perforated with holes. If these holes are too large to hold golf tees they can be adjusted or changed to prevent the tees from going through—either by soldering on some metal discs or by using strong mesh wire. This inner chamber can be raised or lowered to the bottom of the outer chamber by a foot lever.

Articles to be finished should be clean and dry. Dipping lacquers formulated on true nitrocellulose lines are recommended for finishing work of this kind. The lacquer, after being reduced to the proper body for dipping, is placed in the outer chamber, the amount used being sufficient to completely cover the articles in the inner chamber.

The inner chamber is allowed to remain immersed in the lacquer for about one minute. It is then raised by the foot lever and held in raised position for about one minute during which time most of the lacquer drains out through the holes in the chamber. After this draining the inner chamber is started rotating by motor power. The force of whirling throws off the remaining excess lacquer leaving an "even" film on each article. This whirling also drys the lacquer very rapidly.

The motor is stopped after a short time and the inner chamber is moved by hand to separate any articles that may be stuck together. The motor is again started and the inner chamber is allowed to revolve for three or four minutes, after which the coated articles are dry enough to handle.

In working with light colors, which have less covering power, it is generally necessary to submerge the articles twice in the lacquer, making the necessary whirling after each application.

To increase the gloss and give the articles a polished finish, place them in a tumbling barrel (having the barrel about three quarters full) with a small amount of lacquer paste polish and three or four handfuls of small pieces of soft clean scrap leather. Allow the barrel to rotate for 15 or 20 minutes, 40 to 50-r.p.m. This tumbling will polish the finished surfaces.—J. E. GREENE.

Synthetic Enamel Reducer

In Sept. issue, I notice some questions about the above subject on pages 2 and 38.

In using synthetic enamels it is wise to use only the reducers the manufacturer recommends for his particular enamel. However, I have contacted several industrial plants that have used the following solvents as a reducer: tuluol, solvent naphtha and xylol.—J. E. GREENE.

How Much Water in Your Alcohol?

On page 32 of July issue of INDUSTRIAL FINISHING, "D.N." asks how to determine whether or not alcohol contains water.

In answering this question it must be said that *all alcohol contains a certain percentage of water;* even "absolute alcohol" contains slight amounts varying up to almost 1% of water. Commercial denatured alcohol is "188-proof" or about 94% to 96% alcohol by volume, the balance being water.

For general shop practice the easiest and quickest way to determine the percentage of alcohol

present is to use an *alcohol proof hydrometer*. If this is not available an ordinary *light liquid hydrometer* will do. The proof hydrometer gives readings directly in "proof" of alcohol being tested. As "proof" is double the percentage of alcohol, it is a simple matter to tell what percentage of alcohol is present. . . . "100-proof" is 50% alcohol, "150-proof" is 75% alcohol, etc. Light liquid hydrometer readings are either in specific gravity or "degrees Beaume," which may be converted to specific gravity; then by reference to a chemical handbook the percentage of alcohol is obtained.

Alcohol has a specific gravity of about .795 at 15.6° C. (60° F.), while water is 1.000 at 15.6° C., and each combination of the two has its corresponding specific gravity. It is well to remember that the alcohol must be at the correct temperature at the time of reading the hydrometer in order to obtain the exact percentage of alcohol present, as slight variations in temperature will change the readings several per cent.—H. R. STEWART.

A Dull Finish on Shellac

Referring to R. V.'s question under the above title in Sept. issue (page 41), I use shellac in my refinishing. On the better jobs I add a "waterproofing," or a small amount of brushing lacquer. I don't know of anything that will give it a dull finish unless you cut the shellac very thin. With shellac, the more coats you apply the higher the gloss, and most anything I know of that you can add gives a higher gloss and bodies up quicker.

About the only way you can get a dull finish is by rubbing. If your jobs are very cheap I believe you could get your effect better by using a dull varnish, of which there are some now that dry very quickly. If you get a few nibs on the tops, rub slightly and clean—or if you have a waxfree surface you might try a thin coat of brushing lacquer which will give you a fairly dull finish.—J. K. COOPER.

Birch, Walnut, Gum

Referring to the questions of A. E. F. (June, page 42 and July, page 34), about matching birch and walnut, also finishing sap gum, possibly some of the bleaching formulas will help you to obtain the desired results. The amount of toning or bleaching depends a good deal on the natural shade of the wood. I would refer you to the March 1928 issue of INDUSTRIAL FINISHING, pages 88 and 119. I have had cases where these formulas have given satisfactory results.—INDUSTRIAL ENGINEER.

The Department of Commerce chart of paint, varnish and lacquer sales shows an upturn from the low in mid-July.

For J. B. Day & Co. in New York

L. S. Butler is now representing the Chicago firm of James B. Day & Co., in New York and Pennsylvania. Mr. Butler, who makes his headquarters at Buffalo, represented the Day Company for many years up to 1930, and is well known among the trade.

Books About Lacquer

Recent publications announced by the Egyptian Lacquer Co., Inc., 90 West St., New York City, include "Ancient and Modern Lacquers," "Egyptian Crackle Enamels," "Egyptian Black Lacquers" and "The Art of Lacquering." Copies will be sent free to executives who make their request on company stationery and mention "Industrial Finishing."

TOP COAT LACQUER

For use over Lacquer Enamel or Bronze Powder finishes on metal.

Light in color
Brilliant High Gloss
Hard Durable Surface
May be buffed if desired

Extensively used on wide variety of articles ranging from caskets to compacts.

When applied with M & W Non-Penetrating Thinner an extra degree of depth and smoothness is obtained.

A comparative test will convince you of its superior qualities.

Your inquiry is invited.

MAAS & WALDSTEIN COMPANY

Executive Offices and Plant
430 Riverside Ave. Newark, N. J.

Chicago Office & Warehouse
1115 W. Washington Blvd.

Los Angeles Office & Warehouse
2416 Enterprise Street

PRESDWOOD AND CELOTEX FINISHES

Four years of careful and intensive research have gone into our perfected system of lacquer finishes for Presdwood and Celotex.

These extraordinarily adaptable surfaces are becoming more and more widely used in industry. Their finishing presents certain definite problems - we have the answer.

Makers of tile, cabinets, boats, toys, refrigerators and any other industrial production utilizing these boards, will find it profitable to consult us.

Write for our new descriptive bulletin

THE VARNISH PRODUCTS CO.

CLEVELAND, OHIO

New Materials and Equipment

Sprays Metal

The Taywal Corp., Chattanooga, Tenn., announces:

"We have perfected a gun for spraying solder or body metal used in repairing automobile bodies and fenders, and we are sure this gun could be adapted to spray any liquid that must be heated before spraying. In a very short time we hope to have a gun that will spray higher volatile metals.

"By making slight changes in our original design we have been able to make a gun that would spray continuously and with very much lower air pressure than the old gun. By doing this we do away with considerable dust that would naturally arise from high air pressure, and furthermore our present coatings are of a much tougher texture.

"This metal sprayer was formerly sold through the Volunteer Sales Co., of Chattanooga, Tenn."

Tests Paint Films

The Film-O-Graph, as announced by Parks Equipment Co., Bourse Bldg., Philadelphia, Pa., is a simple device with which a uniform measured film of paint or other finishing materials can be "laid" on a strip of smooth paper, sheet metal, glass or celluloid to serve as a sample film of the material so it can be compared with other samples being tested for drying time and opacity or hiding power.

The Film-O-Graph is a precision instrument of bronze in two parts—a cylinder 2-in. long and a plunger 1-in. long. The cylinder is 1-in. in diameter on the outside and ¾-in. in diameter on the inside. The plunger fits the bore of the cylinder closely but will pass through by gravity when the cylinder is in upright position.

Part of the bottom end of the cylinder is carefully cut out exactly .0005-in., and through this cut or offset (or "step" as the precision instrument maker calls it) the material to be tested spreads out on

The plunger at right is a close sliding fit inside the cylinder at left.

the surface to which it is applied—as that surface is pulled to slide along horizontally under the Film-O-Graph.

When testing for comparative drying time, opacity, etc., the Film-O-Graph spreader makes it possible to standardize the tests made.

Two or more paint or varnish

films exposed at the same time are under the same conditions of temperature and humidity and are therefore strictly comparative for drying time. Opacity test films are spread on glass or white paper. A film of this thickness is a check on fineness of grinding.

The Film-O-Graph has a very wide range of usefulness not only in the laboratory but also in the shop and in the sales department for demonstrating.

Directions for using it are supplied by the manufacturer.

Heats Liquids in Tanks

Gas fired immersion heaters, extensively used in tanks for heating soda solutions to clean metal parts, etc., are announced by Steam and Combustion Co., 1559 Sheffield Av., Chicago, Ill. These heaters operate successfully on all gases. The burner is such as to "hold" the flame when utilizing the slower burning gases, although under such operating conditions the capacity is somewhat reduced due to combustion chamber flame limitations.

The "SteCom" immersion heater is essentially a gas burner firing into a submerged refractory-lined combustion chamber which is extended into a pipe coil, also submerged—both elements supplying the necessary surface for transfer of heat from the combustion of the gas to the medium to be heated.

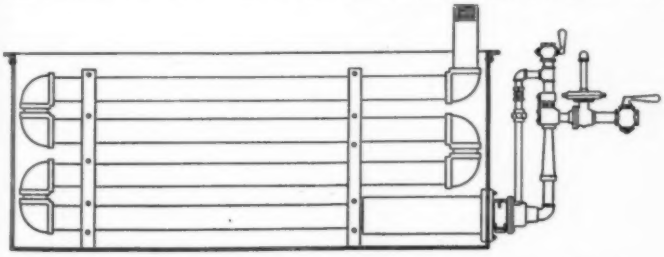
These heaters are of two standard constructions—the two-valve type and the proportional mixer or one-valve type. Basically, they both operate on a common principle.

Automatic temperature control may be had by means of a motor or diaphragm air valve, supplied as additional equipment to the proportional mixer type, the air valve being by-passed with sufficient air to obtain a minimum combustion.

Breathe Clean Air

According to Pulmosan Safety Equipment Corp., 176 Johnson St., Brooklyn, N. Y., more than half of the deaths among industrial workers are caused by respiratory disease brought on or aggravated by breathing impure air, fumes, dust, smoke, etc. The employer who provides and insists that respirators be worn not only checks this terrible toll of life and health but actually improves the efficiency of his men. Modern respirators have the unqualified endorsement of leading safety organizations and prominent safety engineers, and have been adopted as standard equipment by the largest industrial plants.

The newest and most approved designs of respirators are illustrated and described in an 8-page folder entitled "Good News." These include chemical cartridge respirators and dust-proof respirators which are widely known and popular for protection against fine dust and finishing room spray. These respirators combine the desirable qualities of safety, comfort and feather lightness. The



Typical installation of proportional mixer type and heating coils in steel tank.

body is aluminum, shell-shaped to fit all types of faces comfortably. Wool felt filters, protected on both sides with wire screens, prevent the finest dust particles from penetrating while inhaling—and a positive flutter valve allows exhaled air to escape easily and naturally. A screw cap enables the workman to take the entire device apart for cleaning or replacement. Adjustable elastic head straps are equipped with hook and ring at one end, with snap fasteners to attach to respirator body.

Other models of respirators have goggles attached.

Cleans Compressed Air

The Swendeman automatic separator, as announced by the Leavitt Machine Co., Orange, Mass., is an automatic device that eliminates oil and water from compressed air lines.

Exclusive features of the Swendeman separators are:

1—The breaking of an otherwise air-bound condition by the use of a small screen-protected vent which is open to the air at all times.

2—The ability of the separator, by its correct principle of construction and by means of this vent, to expel all moisture automatically as fast as it accumulates.

3—The use of a separate chamber designated as an eliminator, for the immediate removal of the moisture from the air stream of the separator, so there is no possibility of the air picking it up again.

The Swendeman separator is simple, compact and dependable. It is entirely automatic in operation and easily installed, and requires no complicated piping. It is designed for the sole purpose of removing water and oil condensation from compressed air lines. The separator obviates the necessity for the human element and gives remarkable efficiency.

According to the manufacturer the eliminator on this separator is not a trap. It is never closed and retains no oil or water, and no oil or water can get by it. Drawing off oil and water by hand-operated valves affords at best but partial and temporary relief, for as soon as the valve is closed, oil and water again accumulate, continually saturating the air, necessitating frequent repetition of the operation.

Dependable Industrial
FINISHES
Varnishes — Paints — Enamels
Japans — Stains — Lacquers
Special Finishes — since 1865
THE CINCINNATI VARNISH CO.
Division of The Fox Paint Co., Inc.
Cincinnati . . . . . Ohio

Pioneer Builders
Of Air Heaters
NICHOLS PRODUCTS
CORPORATION
12953 Greeley Ave., Detroit
122 East 42nd Street New York
DIVISION OF ROSS INDUSTRIES, CORP.

A PORCELAIN-LIKE finish in snow white lacquer enamel is used by an electric refrigerator plant where the demands are for a finish that withstands extreme temperatures, and which doesn't "orange peel" or chip.

Represents Glyco Products

Glyco Products Co. Inc., Brooklyn, N. Y., announces the appointment of Harold W. Feuchter of Buffalo, N. Y., as sales representative for the Buffalo district. Mr. Feuchter was formerly research chemist for the National Aniline & Chemical Co., and will render service on the newer emulsifying agents, synthetic resins and waxes.

How to Apply

Decalcomania Transfers

by William J. Miskella

DECALCOMANIA is a very interesting word which describes the method of making a lithographic print on a specially prepared paper so that the design may be transferred to any desired surface where it is to remain permanently. While a few colors are used to reproduce some special designs or effects, bronze and aluminum predominate.

The greatest use to which this process is adopted is in reproducing, uniformly, manufacturers' advertisements, trade marks, serial numbers, or applying a decorative design to some article in a neat inexpensive yet an attractive and artistic manner. They are also used by fleet owners to save the cost of hand-lettering trucks or other vehicles. Decalcomania transfers have become real works of art.

It is the same process we as children used. This childish feat was accomplished by soaking the small penny print in water and then firmly pressing the transfer face down on the back of our hand, finally removing the paper backing, leaving, to our delight, the original colorful design. Thus from a childhood feat grew one of the largest industries of today.

To apply the better grade of decalcomania transfers it is necessary to have (1) a bottle of benzine, (2) a 1-in. flat camel's-hair brush, (3) a roll of cotton batting, (4) a hand rubber roller, (5) a small sponge, and (6) a supply of cheesecloth.

Films of pure oil paints and varnish are now generally employed in making this type of transfer, several coats being applied to give sufficient body. Sometimes lacquer is used in the film.

In some instances the design is printed on the gummed and starched surface of a specially prepared paper (the best of which is made in England) to carry the color satisfactorily. The application of the transfer is accomplished by dipping the printed transfer in water, applying it face downward to the surface to be decorated and then peeling off the paper backing, thereby exposing the positive face of the original design. After the coating of gum and starch has been washed away with water, the transfer is usually preserved with a coat of varnish.

It is interesting to note the scope of the field covered by transfers; in addition to the truck lettering already mentioned, there are designs on the sides of railway cars, firm names to designate products and articles of various kinds, advertising matter on store windows and show cases, imitation grain of wood, leather and even marble.

Various grains of wood and

IMPERVIOUS

LACQUERS, VARNISHES and ENAMELS

FOR INDUSTRIAL USE

ENAMELS · IMPERVIOUS · TRADE MARK · IVCO · PRODUCTS · VARNISHES · LACQUERS

Manufactured By

IMPERVIOUS VARNISH COMPANY

General Offices: Koppers Building

PITTSBURGH, PA.

Combining Quality

with HIGH PRODUCTION

SUPERIOR GALVANNEALED and SUPERIOR SUPER-METAL Steel Sheets are soft and ductile. They are easy to work with and withstand severe forming operations without fracture or injury to the coating. The spelter (zinc) is *fused* to the base metal by a *Patented Heat Treating Process*. They are far superior to ordinary galvanized sheets.

Write for Interesting New Book

The SUPERIOR SHEET STEEL CO.

(Division of Continental Steel Corporation.) CANTON, OHIO

Manufacturers of: Black, Galvanized, Long-Terne and Special Coated Sheets Roofing and Kindred Products; Billets, Rods, Wire, Nails and all types of Fence.

Superior Galvannealed

- 1. Has an etched or matlike surface.
- 2. Coating will not chip, flake or peel.
- 3. Withstands severe forming operations.
- 4. Takes paint, lacquer or enamel finishes without preparatory treatment.

Superior "Super-Metal" PATENTED PROCESS

leather may be duplicated by making the decalcomanias direct from photographs of the real wood. Recently one of the large automobile manufacturers adopted decalcomania transfers for imitating beautiful walnut on the instrument boards of cars.

Much of the china manufactured in the U. S. is decorated with decalcomania designs. Children's toys furnish a most fruitful field, as do all kinds of tin containers for fruit and vegetables, cereal containers, etc. Monograms on automobiles are applied both by hand and by the stencil process but when the number of cars permit, decalcomania transfers are used. Individual decalcomania letters may be purchased in various styles and types for this and other purposes.

The following are general directions for application:

1—Separate the parts of each double or duplex transfer at one corner slightly. Apply a very thin coat of transfer cement, or a quick-drying varnish, to the transfer. If the transfer cement is too thick, thin it with turpentine to flowing consistency. Use a wet sponge to dampen the surface upon which it is to be applied.

2—Allow the transfer to stand for five or ten minutes until the cement becomes very tacky or sticky.

3—Set the transfer in place and roll it down with a rubber roller, preferably from the center outward to the edges, so that it will be pressed firmly against the surface being decorated.

4—If a single or simplex paper transfer is used, wet the back of the paper with a sponge and water and roll again, wetting and rolling alternately until the paper is thoroughly saturated with water.

If a duplex or double paper transfer is used, the heavy paper should be peeled off before applying the water. This is done by having a little tacky cement on the tip of the finger and pressing down firmly in one corner of the transfer, then jerking up quickly, thereby releasing the heavy paper from the thin paper on which the transfer is printed. After removing the heavy backing paper, water should be applied to the tissue paper, the same as when transfers on single paper are used.

5—Pull off the thin paper and wash the face of the transfer first with a sponge and water and then with a soft cloth or sponge, or with cotton batting, using benzine (preferably) to remove the gum deposit from the face of the transfer and the surplus cement from around the edges. Finally, go over the entire transfer with a clean cloth to thoroughly dry it.

6—The transfer should be al-

VARSEAL
THE LATEST THING IN SEALERS
Equally Satisfactory Under Varnish or Lacquer
A Distinct Saving Over Shellac
THE GILBERT SPRUANCE CO.
Richmond and Tioga Sts. Philadelphia

lowed to stand two or three hours, or longer if possible, before covering it with a coat of varnish. The article on which the transfer is to be applied must be smoothly finished. Woodwork—no matter whether it be part of a wagon, truck, automobile, or a piece of furniture—must be filled and varnished at least once to make a clean smooth surface to receive the transfer.

Perhaps just a word of caution should be given. If the transfers are applied before the cement is properly set, or if the cement is spread too thick on the transfer, the setting or contracting takes place after the paper has been removed and will cause it to contract or wrinkle. If the sticky gum that remains is not washed away when the paper is removed, this gum will dry and crack the transfer. It is important to remember that fresh transfers will not stand washing with benzine or turpentine, but after a transfer has dried or seasoned for ten days or two weeks, it will work better.

Gas Range Finishes

PORCELAIN enamel finishes in a variety of pleasing color combinations attracted considerable feminine attention to "Norman" gas ranges, exhibited by the Galusha Stove Co., of Rochester, N. Y., at the Rochester Industrial Exposition, Sept. 5 to 10.

"Lustrous effects are obtained by electrically porcelain enameling the cast iron base in modern ovens," the plant manager explained. "Three coats are applied," he said; "the first at 1,600° F., requires 4 to 4½ minutes; the second, at 1,540° F., gets from 3½ to 4 minutes, and the last at 1,500° F., about three minutes in the oven.

"Ivory and contrasts of gray and shades of green, as well as a marbleized velvetone, are particularly popular color schemes with women, who now demand harmony in the kitchen," Mr. Kennedy observed. The ranges are porcelain finished inside and out.—R. J. PHILLIPS.

PLATING with chromium often requires the use of racks which must be insulated and protected from metal deposits during the plating process. A finish designed especially for use on these racks has been developed by one leading finish manufacturer.

Letters

(Continued from page 6)

Ordinary putty colored to walnut shade turns white.

We have tried "Plastic Wood" but it takes considerable more time to use than regular putty, therefore, we would like to have your recommendation on a nail-hole filler that will work like putty.—U. P. X. G. Co. (Display Fixtures, Furniture)

Non-Grain-Raising Stain

On page 22 of Sept. issue you describe a new non-grain-raising stain, and we would appreciate your advising the name of the manufacturer putting out this product.—F.E.Co. (Commercial Desks).

Mother-of-Pearl Stain

Can you furnish me information as to methods and material for staining Mother-of-Pearl (mussel shell) for tiles, buttons, inlay, etc.? The stains should be non-fading.—E.A.B.

To Agitate Baking Enamel

In your "Industrial Finishing" for Sept., 1932, there was an interesting article by F. T. Harrison entitled "Air

Compressors." There is one particular point in this article we are interested in, and that is the practicability of using an air compressor for agitating paint.

Do you know if there are any particular complications in connection with using this compressed air system in agitating baking enamel? This is one of our problems—to keep our paint properly agitated, and we would appreciate your giving us any information you may have, or the names of parties we can refer to who are familiar with this method.—U.N.F.I.Co. (Electric Hardware).

Brisk and Up-to-Date

Your magazine, INDUSTRIAL FINISHING, has been handed to me monthly of late and I find it a good brisk and up-to-date magazine, with many new lines of material for the trade. I just take this means of informing you that I am reading your paper.—C. L. T. (Foreman of Paint Shop, The A. C. M. Co., Anaconda, Mont.)

Machine De-Oils Metal

It may be of interest to you to know that we have just recently put on the market a machine for d'oiling metal known as the Mechanical Process Corporation D'Oiler.

In this machine one of the chlorinated solvents, which we term "D'Oilene," is evaporated to obtain the vapor therefrom and any metal or hard substance placed in this vapor is quickly d'oiled or degreased by the condensation of the vapor upon the surface of the article and the absorption of the grease and oil.

This machine has many points of interest and merits over any of the competitive devices on the market and if you have a representative in this territory we will be very glad to have him call and we will show him and explain to him the operation of this equipment.—Mechanical Process Corp., Newark, N. J.

Comments on September Letters

I would appreciate the name of the firm "C.T." who inquires about "Stains for Wood" on page 46, September issue, as we have our "Permastayne" line of stains which will not raise the grain and are permanent in color.

Would also like to get the name of the firm "M.W." regarding "Synthetic Enamel Reducer," page 2, as I can probably give them a formula which will work satisfactorily if they can send me one quart of material and will pay for an analysis.

Also, I would like to be put in contact with "L.M.Co." in reference to "Wood Putty Fillers" (page 2).

Tell "T.S.Co.," who wants to know how to "Stripe Imitation Tile" (page 4), to try an ordinary oil can for "flowing on" the striping color.—E. M.S. (Industrial Sales Dept. of Paint & Varnish Co.)

Lacquers Lots of Fabrics

On page 2 of the September issue of "Industrial Finishing" we notice that "C.C." is inquiring for the names of concerns who finish fabrics with lacquer coating. May we ask you to advise your correspondent that we are doing this class of work regularly? The fact is that we have been doing lacquer coating on cretonnes, drills, ducks and other fabrics for several years.—The Permatex Fabrics Co., Jewett City, Conn.

Hy-Speed MIXERS

ARE NEVER IDLE

Barrel to barrel . . . tank to tank . . . the wise foreman of the busy shop keeps "Hy-Speed" Mixers everlastingly at their efficient work; mixing batch after batch of finishing materials or their ingredients.

ALSOP ENGINEERING CO.

39 West 60th Street New York City

Industrial Finishing
MAGAZINE

Issued fifteenth of each month. Distributed exclusively to executives and foremen finishers in all kinds of industrial plants where finish coats are applied.

PRACTICAL PUBLICATIONS, Inc.
Publishers

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Advertising rates on application.

EDITORIAL

Homemade Stuff

Inquiries to the Editor reveal an increasing demand among finish users for information about how to "make their own" materials for certain purposes, where to buy cheaper materials and what to use as substitutes for various purposes. Some of the questions can be answered here; others must be referred to other sources of information or supply.

While undoubtedly it is wise to cast about for means of effecting economies and preventing wastage, nevertheless the practice of going in for homemade stuff and cheaper materials may lead to grave errors and costly experience.

The purchaser of manufactured or refined products of known quality is getting not only the materials or supplies he buys, but also the benefit of all the knowledge, experience and resourcefulness of the concern that specializes in supplying them. This can mean a great deal in the way of guaranteeing the uniformity, pureness, reliability, genuineness and all round value of what is purchased.

To finishing users we make this suggestion: Go in for sensible economy and strive to eliminate all needless waste, but be very hesitant and doubtful about committing yourself to the use of cheap substitutes and homemade stuff. It may cost you a heavy penalty in damaged goods, complaints and loss of good-will.

The Finish That's Popular

According to one of our New York correspondents, a leading furniture manufacturer in his state declares that: "What we are making and what people want in furniture is the appearance of age and use. The substantial, well finished, well kept piece of furniture that shows some signs of service has more hominess about it and a more inviting appearance than that cold strangeness and stiffness of a piece of furniture that shows the uniform gloss of newness.

"Many people don't like new things because they are untried, uncertain and for a short time they are likely to make the owner feel uncomfortable, ill at ease or perhaps embarrassed. A traveling man doesn't like to carry a new traveling bag. Most people don't like to wear new shoes. A new chair isn't as inviting as an old one—and so at our plant we are turning out chairs and other furniture which have that friendly inviting appearance of something that has long been used."

In an attempt to satisfy the public's preference for surfaces that show the appearance of age, finishers and finish manufacturers

have developed many "tricks of the trade" in the way of decorative treatment and novelty finishes for new goods, to imitate what age and service have done for the genuine older goods.

Consider the Finisher Too

An industrial finishing demonstrator reminds us that, "unskilled and careless workmanship is a matter that is within the control of the employer, but the employer is often at fault in forcing impossibilities upon the finisher whose protests, if outspoken, do not avail."

Continuing, he says: "The skilled finisher is far above the ordinary worker; years of patient study and actual experience have familiarized him with the materials and equipment he uses—its properties and peculiarities and how, when and where it can be applied to produce best results for his employer, and do credit to himself. If he is called upon to deliver finished products within a time too limited for the proper drying of the several coats, everyone is placed at a disadvantage. The finish is hastily blamed, or the finisher is misjudged. The finish is poor and without durability, and the customer condemns the product. Sometimes the finisher is not furnished proper materials and equipment—and no one knows better than he that good work cannot be produced in a poorly fitted room. If the employer has sufficient confidence in the finisher to employ him and retain him in service, the finisher's judgment should be respected as to the material, equipment and arrangement of his finishing room. The finisher can then justly be held responsible for general results of the finished product."

In Small Shops, Too

There was a time, some years back, when the smaller shops were practically excluded from performing many kinds of work, because the equipment necessary for doing it was only available in large units; and a lack of floor space, as well as of capital, stood in the way of making the necessary investment. It is interesting to observe that present-day methods are continually becoming more elastic, and that units are now being produced to suit the demand of the smaller plants.

Electric furnace enameling of sheet ware is a case to point. There are now plants operating continuous electric furnaces of this type that are only about 40-ft. long, and handling about 1500-sq. ft. of sheet ware per hour. Thus the well known advantages of continuous operation are brought to the small establishment also.

Expert Striping

We now have a great variety of special stripers and striping equipment available, and it must be admitted that most of it is good. One type of striper is better for this kind of work—the other kind is superior for that. When we examine many products which are to be striped, however, we find some tight inside corners and other locations where the old hand method must apply. Where this is the case, two-thirds of the trick in getting a goob job, especially where lacquer is being used, is in the skillful use of proper striping brushes. Some finishers and decorators even have special striping brushes made to order. Others are content to select from stock the particular brush which comes nearest to their requirements.

Classified Advertising

Advertisements under this heading 45 cents a line per insertion, minimum charge, $1.35. In estimating, calculate six words to one line, and add one additional line for heading. Use this department to obtain help, find positions, buy and sell equipment, dispose of manufacturing properties, etc.

INDUSTRIAL SALESMEN

Well established manufacturer of complete line of industrial varnishes, lacquers, enamels and synthetic products. Have openings, Jamestown, Cleveland, North Carolina and Boston. Proven producers only need apply. Address IF-435, care Industrial Finishing.

INDUSTRIAL FINISHING SALES REPRESENTATIVES

With following in middle west and New York state wanted by moderate size eastern manufacturer. Attractive proposition for immediate business. Only those who can earn over $10,000 per year will be considered. Give complete details in first letter. All replies will be held in strict confidence. Our sales force has knowledge of this ad. Address IF-437, care Industrial Finishing.

SALESMEN WANTED

With following and experience in Michigan and Iowa, by old established Chicago manufacturer of Varnishes, Lacquers and Paint Products. Give complete details in first letter. Address IF-446, care Industrial Finishing.

WANTED—SPRAYER SALESMAN

On a liberal commission basis. Will give territory actively canvassed. Full equipment manufactured. Address IF-445, care Industrial Finishing.

USED SPRAY PAINT EQUIPMENT

Get my prices on used outfits, guns, booths, fans, guaranteed. HOVEY SPRAY PAINT EQUIPMENT, 17th & Lehigh, Philadelphia, Pa.

FINISHING FOREMAN

Desires position. Expert on mixing and matching stains, enamels and fillers. Understands modern finishing and production methods, can organize finishing department from the ground up. Location and salary no object. Address IF-444, care Industrial Finishing.

POSITION WANTED

As foreman finisher or demonstrator. Four years' experience as foreman finisher; six years' experience as demonstrator. Address J. M. VERDEROSA, Parlin, N. J.

SALESMEN WANTED

Well organized small company in New Jersey manufacturing a complete line of lacquer finishing materials for every purpose has an opening for two salesmen in New York state and New England, on a strictly commission basis. There will be close cooperation, quick service, and a better than average opportunity to earn more than an ordinary income. This offer will appeal to two men who have a knowledge of finishing materials and a following in the industrial field. Address IF-443, care Industrial Finishing.

POSITION WANTED

A varnish and lacquer salesman, with 24 years' continuous practical business and selling experience, has accumulated a large acquaintanceship among industries in Chicago and nearby states. Would like an executive position. Am now employed selling. Address IF-447, care Industrial Finishing.

INDUSTRIAL FINISHES SALESMAN

Must have following in Central states. Give full details as to class of trade and materials sold. Address IF-448, care Industrial Finishing.

WANTED

Experienced practical varnish and lacquer tester. We have an opening for a man who has had considerable furniture finishing experience and also considerable varnish factory testing and sampling experience. In replying, advise age, salary expected, what furniture plants you have worked for and how long at each and what varnish factories you have been with and how long at each. Give recent references. Address IF-449, care Industrial Finishing.

GET YOUR ORDER IN EARLY FOR THE

New Volume VIII

Industrial Finishing

Nov. 1931 to Oct. 1932 Incl.

Price $5.00

Cash With Order

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